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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/414,004 10/07/99 KATSAF

V 2925-0411P

EXAMINER

MM91/1001
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FERNANDEZ, K	
ART UNIT	PAPER NUMBER

2881
DATE MAILED:

10/01/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/414,004

Applicant(s)

KATSAP ET AL.

Examiner

Kalimah Fernandez

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 03 July 2001 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on 7-3-01. These drawings are acceptable, however applicant is required to submit substitute formal drawing. Since even with the proposed correction the drawing fail to adhere to drawing standards outlined in Form PTO 948 mailed to applicant on 01-08-01.
2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the curved-shaped mesh grids as in claims 33 and 39 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.
3. Figure 9 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Namely, Fig.9 is a replica of Figure1 of US Pat No. 5258246 issued to Berger et al.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 33 and 39 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for plurality of mesh grids, does not reasonably provide enablement for a plurality of curved-shaped mesh grids. The specification does not enable any person skilled in the art to which it pertains, or with which it is most

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nearly connected, to implement curved-shaped lens array as the invention commensurate in scope with these claims. The implementation of curved-shaped mesh grids is not sufficiently disclosed because no description of how the curved shaped are configured to effect spherical aberration is provided. Nor how such a configuration fits into an electron exposure apparatus and interacts with the other elements like extraction elements is provided.

6. Furthermore, although applicant concludes that the fabrication of mesh grids are well known in the art (see page 5, lines 19-31 of spec.) and therefore no explanation is needed. However, the fabrication of curved-shaped mesh grids has no support with this assertion.

7. Specifically, It is acknowledged that fabrication techniques are well known in the art, however the fabrication of a curved-shaped mesh grid is not sufficiently known in the art as to enable a skilled artisan to carry out the claimed invention. Namely, it is common and expected in the art to incorporate flat mesh grids as illustrated in US Pat No. 4419182 by Westerberg et al, but it is not common to incorporate curved-shaped mesh grid made of metal sheets as discloses on page 5, lines 25-29.

8. Furthermore, applicant fails to sufficiently disclose how a plurality of curved-shaped mesh grids will decrease spherical aberration in an electron exposure as claimed. Or how such a configuration will interact with the overall system. A skilled artisan would expect a description of how a curved-shaped grid will effect extraction and what the potential distribution would be over the plane of curved-shaped grids. In other words, applicant fails to disclose how to implement a plurality of curved shaped grids

and to sufficiently illustrate the effects of multi- curved lens as to enable a skilled artisan to effectively carry out his invention.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-3, 8-10, 14-16, 19-21, 25-26, 31 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pat No 4390789 by Smith. Smith discloses all limitations of the claimed invention. See previous office action mailed on 1-08-01 for details.

11. In regard to the newly added functional language, “ said lens array is configured to increase emittance of an electron beam which passes through said lens array. The functional recitation that the lens array operate to increase emittance of an electron beam is not sufficient to be distinguishable over Smith, since no structure or means to achieve this aim has been recited other than the structure of Smith’s invention. Specifically, Smith discloses a lens array, which operates to control the emittance of the electron beam and is associated with a fine deflector assembly to the direct the electron beam (see abstract). Therefore, Smith anticipates the totality of the claimed invention.

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12. As per claim 31, Smith does not explicitly state that a sufficiently divergent beam is produced after passing through the lens array. However, it is considered an inherent feature, since the aim of EBAL system is to achieve a large field of view by implementing a means to control the emittance via the lens array, followed by directing the electron beams via the associated deflectors. Therefore, inherently Smith discloses the production of a divergent beam via the lens array.

13. Alternatively, claims 1-2,8,11,13-16,19,22,24-28,31 are rejected under 35 U.S.C. 102(a) as being anticipated by "Mesh equipped Wehnelt source for SCALPEL", Katsap, Waskiewicz, Sewell, and Rouse, SPIE, vol.3777, pages 75-81.

14. In this article, the claimed invention is disclosed in totality. Specifically, a charged particle illumination system having a lens array (or mesh grid) configured to increase emittance of an electron beam (see abstract and figure 1).

15. As per claims 13 and 24, the article discloses 65% transparency on page 79, lines 2-3.

16. It is acknowledged one or more applicant are authors of the cited prior art, but since the inventive entity is not the same in both the application and the publication, said claims are properly rejected under 35 USC 102 (a).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 4-7, 11-13, 17-18, 22-24, 29-30, and 35-38 are rejected under 35

U.S.C. 103(a) as being unpatentable over Smith and in view of US Pat No. 5376792 by Schamber. See previous office action for detailed explanation.

19. As per claim 38, this limitation holds no criticality to one skilled in the art, since it is derived from well-known theorem in the art. Furthermore, the addition of this limitation does not solve any stated problem or is for any particular purpose other than theoretical explanation.

20. Claims 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith. Smith teaches the claimed invention except for increasing of the emittance by a factor substantially equal to $(L/d)^2$. This limitation has been discussed above in addressing claim 38.

Response to Arguments

21. Applicant's arguments filed 7-3-01 have been fully considered but they are not persuasive. Applicant's attempt to overcome the grounds of rejection by adding the functional language "to increase emittance" is not sufficient. Since, it is held that Smith's lens array would effectively increase emittance, since said lens array is used to control emittance. Moreover, it's well established that the aim of incorporating the lens array is to increase the field of view of the electron exposure apparatus. Therefore, it is

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considered to be inherent in Smith's teaching of a lens array that emittance will be increased.

22. Furthermore, a functional recitation, such as "to increase emittance", of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

23. Applicant fails to disclose any structural difference between the cited prior art neither discloses any particular matter said emittance should be increase other than using a lens array, which inherently increases emittance.

24. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., production a divergent electron beam) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

25. The limitation occurs only in the newly submitted claim 31, which has been addressed above. And to reiterate it is considered inherent that the implementation of a lens array as taught by Smith would produce a divergent electron beam, which emerged to be control by the associated deflectors. It is acknowledged that collimation occurs before said electron beams traverse the lens array, however contrary to applicant's

assertion Smith does not disclose that the lens array acts to produce a collimated beam(s).

26. Since, the production of a divergent electron beam was not introduction previously, this issue was not addressed in the previous office action. However, to aid in applicant's understanding of examiner's interpretation of Smith, applicant is referred to US Pat No. 4200794 by Newberry et al, which is incorporated into Smith's disclosure (see col.6, lines 34-45). Specifically, Newberry discloses the intended mirco array described by Smith as illustrated in figure 17 of Newberry, the lens array is configured to produce a divergent beam and not as applicant claims a convergent beam. Moreover, the shape of an exemplary aperture (35) would not result in a more collimated/or convergent beam, but a divergent electron beam. Therefore, applicant's assumption is incorrect and the argument has no validity.

27. In response to applicant's argument that Smith is not concerned with controlling the emittance of the electron beam. It is acknowledged that Smith's invention is not the lens array or its function, however the fact that Smith is directed to another aspect of an electron exposure apparatus does not disqualifies it as prior art, if Smith discloses the elements of the claimed invention either implicitly or explicitly, it qualifies as prior art.

28. In addition, applicant is directed to Smith's reference incorporation of Newberry, which addresses how the micro lens array is made as to achieve emittance control to provide large field coverage (col.1, lines 20-30 of Newberry).

Conclusion

29. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kalimah Fernandez whose telephone number is 703-305-6310. The examiner can normally be reached on Mon-Fri between 7:00am-3:30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teresa Arroyo can be reached on 703-308-4782. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

kf

September 21, 2001


JACK BERMAN
PRIMARY EXAMINER

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